9th 10th Chemistry Solved MCQs for SST BIO/Chem

Chemistry
For Class 9th & 10th

1. Atoms are made of sub ________.
   (a) Atoms (b) Molecules
   (c) Charges **(d) Atomic particles**
2. ________ revolves in orbit around nucleus.
   (a) Electron (b) Proton
   (c) Neutrons (d) Nil
3. Electrons carry ________ charge.
   (a) + **(b) -**
   (c) Neutral (d) Double Positive
4. Protons carry ________ charge.
   (a) + (b) -
   (c) No (d) Neutral
5. Neutrons have ________ charge.
   (a) + (b) -
   (c) No (d) Nil
6. Atom as a whole is ________.
   (a) + (b) -
   (c) No **(d) Neutral**
7. The number of proton in an atom is called ________ number.
   (a) Molecular (b) Formula
   (c) Atomic (d) Molar
8. The atomic number is represented by ________.
   (a) A (b) Y
   (c) X **(d) Z**
9. The atomic number of sodium is ________.
   (a) 9 (b) 10
   (c) 11 (d) 12
10. Number of protons + neutrons is:
    (a) Atomic mass **(b) Mass numbers**
    (c) Both (d) Nil
11. There are ________ elements found till now.
    (a) 120 **(b) 118**
    (c) 119 (d) 117
12. ________ elements naturally occurring.
    (a) 92 (b) 118
    (c) 93 (d) 117
13. Elements are represented by chemical ________.
    (a) Abbreviation (b) Unit
    (c) Symbols (d) It can be represented
14. The symbol of sodium is:
    (a) Sa **(b) Na** (c) Pa (d) Ca
15. A ________ is a pure substance is made up of two or more elements.
    (a) Mixture (b) Element
    (c) Solution **(d) Compound**
16. ________ can be decomposed into simpler substances.
    (a) Compound (b) Element
    (c) Solution (d) Mixture
17. The formula of benzene is ________.
    (a) $C_6H_6O_3$ **(b) C_6H_6**
    (c) $C_{12}H_{22}$ (d) Nil
18. ________ can be separated by physical means.
    (a) Mixture (b) Compound
    (c) Solution (d) Nil
19. Mixture has ________ types.
    (a) 3 **(b) 2** (c) 1 (d) No types
20. Which one is an example of heterogeneous mixture?
    (a) Ice cream (b) Concrete
    (c) Both a & b (d) Nil
21. Salt & Water is a ________ mixture.
    (a) Homogeneous (b) Heterogeneous
    (c) It is not mixture (d) Nil
22. ________ which occupies space and have mass.
    (a) Matter (b) Atom
    (c) Molecule (d) All of above
23. The quantity of matter in a body is called ________.
    (a) Mass (b) Weight
    (c) Atom (d) Molecule
24. The period of Alchemists extends from ________ AD.
    (a) 800 to 1800 **(b) 600 to 1600**
    (c) 900 to 1900 (d) 700 to 1700
25. Al chemist invented all except:
    (a) Beakers **(b) Spirit lamp**
    (c) Funnels (d) Retorts
26. The branch of chemistry which deals with qualitative & quantitative analysis of matter is:
    (a) Analytical (b) Nuclear
    (c) Biochemistry (d) Organic
27. All the things in the world are made up of ________.
    (a) Mass (b) Weight **(c) Matter** (d) None of these
28. ________ is an example of substance.
    (a) Carbon (b) Hydrogen
    (c) Oxygen **(d) Water**
29. ________ is a pure substance that can be broken down.
    (a) Matter **(b) Element**
    (c) Mass (d) Mixture
30. The dead remains of animals are converted into ________.
    (a) Hydrocarbons (b) Waste
    (c) Does not change (d) Nil
31. Mass no is represented by:
    (a) A (b) B
    (c) C (d) D
32. One carbon is ________ times heavier than hydrogen.
    (a) 12 (b) 13
    (c) 14 (d) 15
33. An ion is a charged particle:
    (a) True (b) False
    (c) In some conditions (d) Never
34. Positive ions are formed by ________ of electrons.
    (a) Gain **(b) Loss**
    (c) Sharing (d) Bonding
35. $Na \rightarrow Na^+ + e^-$, what type of ion it is:
    (a) Positive (b) Negative
    (c) Neutral (d) Charged

179. Electrolyte is __________ solid form.
(a) in
(b) Sometimes in
(c) Never in
(d) Always in

180. Films are coated by special chemical known as __________ detectors.
(a) Photographic
(b) Image
(c) Nil
(d) Both

181. CO_2 the oxidation number of C =
(a) +1
(b) +2
(c) +3
(d) +4

182. Metals are covered by using:
(a) Baeyer's test
(b) Bohr's
(c) Electrolysis
(d) None

183. Copper extracted from its ore is __________ % pure.
(a) 98%
(b) 99%
(c) 96%
(d) Nil

184. Metals form a __________ part of earth on which we live.
(a) Smaller
(b) Larger
(c) Medium
(d) Nil

185. The earth is made up of ______ % of aluminum.
(a) 6
(b) 7
(c) 8
(d) 9

186. The earth is made up of ______ % of iron.
(a) 4
(b) 5
(c) 6
(d) 7

187. The earth is made up of ______ % of calcium.
(a) 4
(b) 5
(c) 6
(d) 7

188. The core of the earth is __________ than crust.
(a) Lighter
(b) Heavier
(c) Both
(d) Nil

189. Es is symbol of:
(a) Erbium
(b) Einsteinium
(c) Europium
(d) Fermium

190. The core of the earth is mostly made from __________.
(a) Nickel
(b) Iron
(c) a & b
(d) Copper

191. Oxygen is __________.
(a) Metals
(b) Non-metals
(c) Gas
(d) b & c

192. Which one of the following belongs to Noble Gases?
(a) O
(b) F
(c) Ne
(d) Nil

193. Hydrogen is a __________.
(a) Metal
(b) Non metal
(c) Metalloids
(d) Nil

194. Potassium's atomic no. is:
(a) 17
(b) 18
(c) 19
(d) 20

195. __________ is drawn in wires.
(a) Gold
(b) Silver
(c) Helium
(d) Nil

196. Gold can only be dissolved by:
(a) Acids
(b) Bases
(c) Aqua Regia
(d) Nil

197. Silver is a __________ metal.
(a) Pure
(b) Noble
(c) None
(d) All

198. All are noble metals except:
(a) Silver
(b) Gold
(c) Hydrogen
(d) Platinum

199. Gold was used for utensils as early as __________ BC.
(a) 3400
(b) 3500
(c) 3600
(d) 3700

200. ______ metals are electronegative in nature.
(a) Pure-
(b) Noble-
(c) Non-
(d) Nil

201. ______ are important component of atmosphere.
(a) Oxygen
(b) Nitrogen
(c) Helium
(d) Both a & b

202. Reversible reaction is represented by:
(a) →
(b) ?
(c) ←
(d) ⇌

203. $2NO_2 \rightleftharpoons N_{2(g)} + O_{2(g)}$ is __________ reaction.
(a) Reversible
(b) Irreversible
(c) Products
(d) Nil

204. The unit of K_c is.
(a) Mol
(b) dm^3
(c) No unit
(d) Nil

205. The second condition for equilibrium is called ____ method.
(a) General
(b) Flow
(c) Simple
(d) Complex

206. An equilibrium establishes when rate of forward reaction become __________ backward reaction.
(a) =
(b) >
(c) <
(d) Λ

207. H_2 reacts with I_2 and forms 2HI, is a ______ reaction.
(a) Reversible
(b) Irreversible
(c) Forward
(d) Backward

208. Law of mass action was presented by ______.
(a) Goldberg
(b) Waage
(c) Both a & b
(d) John

209. Law of mass action was presented in ______.
(a) 1884
(b) 1874
(c) 1864
(d) 1865

210. Reversible reactions ______ go to completion.
(a) Goes
(b) Do not
(c) Always
(d) Sometimes

211. Reversible reactions are ______.
(a) Very fast
(b) Fast
(c) Slow
(d) Nil

212. Irreversible reaction goes to ______.
(a) End
(b) Completion
(c) Final
(d) Nil

213. Irreversible reaction is represented by ______.
(a) →
(b) ←
(c) ⇌
(d) ↔

214. ______ does not occur in irreversible reactions.
(a) Union
(b) Intersection
(c) Equilibrium
(d) None of these

215. Liquid ⇌ gas, is a ______ equilibrium.
(a) Chemical
(b) Harmonic
(c) Dynamic
(d) Nil

216. Law of mass action was presented ______ chemists.
(a) 1
(b) 2
(c) 3
(d) 4

(a) Structure of atom★
(b) Size of atom
(c) Mass of atom
(d) Reactivity of atom

14. Goldstein, J.J. Thomson, Rutherford and Bohr proved that the atom is:
(a) Divisible★ (b) Indivisible
(c) Stable (d) Unstable

15. Who discovered protons?
(a) Goldstein★ (b) J.J. Thomson
(c) Bohr (d) John Dalton

16. In 1897, electrons were discovered by:
(a) Rutherford (b) J.J. Thomson★
(c) Newton (d) Bohr

17. According to plum pudding model, an atom is solid structure of positive charge with ______ particles stuck inside it.
(a) Positive (b) Negative★
(c) Free (d) Neutral

18. The rays which are emitted by cathode in a discharge tube when high voltage current is passed through it at a low pressure are called:
(a) Anode rays
(b) Canal rays
(c) Cathode rays★
(d) Neutrons

19. Which of the following element has no neutron in its nucleus?
(a) Oxygen (b) Nitrogen
(c) Carbon (d) Hydrogen★

20. According to Rutherford's experiment, most space of an atom is empty because most particles ______ the gold foil undeflected.
(a) Passed through★
(b) Settled in
(c) Bounced back
(d) Turned obliquely

21. According to Bohr, energy of an electron is:
(a) Continuous (b) Quantized★
(c) Increased (d) Unchanged

22. When an electron jumps from a lower to a higher orbit, it ______ energy.
(a) Radiates (b) Decreases
(c) Absorbs★ (d) Loses

23. What is value of Planck's constant?
(a) 6.36×10^{-34} Js (b) 6.63×10^{-34} Js★
(c) 6.11×10^{-34} Js (d) 6.46×10^{-34} Js

24. According to Bohr, spectrum of an atom is:
(a) Line spectrum★
(b) Broken spectrum
(c) Continuous spectrum
(d) Fixed spectrum

25. The angular momentum of an electron is given by the equation:
(a) $mvr = nh/2\pi$ ★ (b) $2\pi/mvr - nh$
(c) $mvr = 2\pi/nh$ (d) $mvr = nh \times 2\pi$

26. Which letter is used to represent 1st energy level which is closest to the nucleus?
(a) K★ (b) L
(c) M (d) N

27. Which alphabets are used to represent sub shells?
(a) a,b,c,d (b) s,p,d,f★
(c) g,h,i,j (d) w,x,y,z

28. Maximum capacity of a shell to accommodate electrons is given by the formula:
(a) $2n$ (b) n^2
(c) $2n^2$★ (d) $3n^2$

29. The atomic number of oxygen is 8. What will be its electronic configuration?
(a) $1s^2, 2s^2, 2p^1$
(b) $1s^2, 2s^2, 2p^2$
(c) $1s^2, 2s^2, 2p^4$★
(d) $1s^2, 2s^2, 2p^3$

30. An electron first fills 2p orbital before 3s orbital because 2p orbital has:
(a) Higher energy level
(b) Lower energy level★
(c) More number of electrons
(d) Greater distance from nucleus

31. An element has 5 electrons in M

37. **Which of the following metals floats on water?**
    (a) Ion (b) Calcium
    (c) Sodium★ (d) Magnesium
38. **Which of the following is less malleable?**
    (a) Iron★ (b) Sodium
    (c) Gold (d) Silver
39. **Which of the following non metals is lustrous?**
    (a) Sulphur (b) Phosphorus
    (c) Iodine★ (d) Carbon
40. **Which of the following does not react with dilute acids?**
    (a) Iodine★ (b) Sodium
    (c) Potassium (d) Calcium
41. **Density of calcium is:**
    (a) $0.98gcm^{-3}$ (b) $1.74gcm^{-3}$
    (c) $1.55gcm^{-3}$★ (d) $1.60gcm^{-3}$
42. **Boiling point of magnesium is:**
    (a) 880°C (b) 1484°C
    (c) 1494°C (d) 1090°C★
43. **Which metal belongs to 11th group?**
    (a) Gold★ (b) Zinc
    (c) Chrmium (d) Borium
44. **The stability of hydrides is in the order:**
    (a) HI> HCL> HBr> HF
    (b) HI> HBr> HCl> HF
    (c) HF> HCl> HBr> HI★
    (d) HBr> HCl> HI> HF
45. **%age of carbon in human body is:**
    (a) 65% (b) 17%★
    (c) 10% (d) 3%
46. **All halogens are:**
    (a) Reducing agents
    (b) Oxidizing agents★
    (c) Metals
    (d) Semi-metals
47. **Flourine reacts with water:**
    (a) In sunlight
    (b) At high temperature
    (c) In dark and cold state★
    (d) At room temperature
48. **Halogens form _______ bond with metals:**
    (a) Ionic★
    (b) Covalent
    (c) Coordinate covalent
    (d) Metallic
49. **Purity of gold is shown by:**
    (a) Carats★ (b) Ounces
    (c) Pounds (d) Grams
50. **Which non metal is found in the highest percentage in the earth crust?**
    (a) Sulphur (b) Carbon
    (c) Nitrogen (d) Oxygen★

IMPORTANT TERMINOLOGY

A

Acceleration: Rate of change of velocity with time.

Artificial satellites: Man made objects moving in fixed circular orbits around the Earth.

Atomic Physics: The branch of Physics that deals with the study of the structure and properties of atoms.

Axis of rotation: A straight line passing through the points of a rotating rigid body while the other points of the body move in circles about the axis.

B

Base quantity: A quantity, which can be expressed independently without the reference of any other quantity.

Base unit: The units that describe base quantities.

Buoyant force: The force acting on an object due to buoyancy of a liquid.

C

Centre of gravity: The point of a body where its weight acts.

Centre of mass: A point where an applied force causes the system to move without rotation.

Centrifugal force: Centripetal reaction.

Centripetal acceleration: Acceleration produced by the centripetal force.

Centripetal force: The force, which keeps an object to move in a circular path.

Circular motion: Motion of a body along a circular path

Coefficient of linear expansion: Change in unit length caused by unit kelvin change in temperature.

Coefficient of volume expansion: Change in unit volume caused by unit kelvin change in remperature.

Components of a force: Such forces when added give the resultant force.

Conduction: Transfer of heat due to interaction of electrons or molecules.

Couple: When two equal and unlike parallel forces act at different points of a body, they constitute a couple.

D

Deceleration: Negative acceleration.

Density: Mass per unit volume.

Derived quantity: Such quantity which is expressed with reference to base quantities.

Derived units: The units used to measure derived quantities.

Displacement: The shortest distance between two points.

Distance: Length of a path between two points.

Dynamics: Study of motion of bodie under the action of forces.

E

Efficiency: Ratio of output and input.

Effort arm: The intermediate distance between fulcrum and effort.

Effort moment: Product of effort and effort arm.

Effort: Force applied on the machine.

Elastic potential energy: Energy of a compressed or stretched spring.

Electromagnetism: The branch of Physics that deals with the study of the charges at rest and in motion, their effects and their relationship with magnetism.

Energy: Ability of a body to do work.

Equilibrium: A state where acceleration of a body is zero.

Evaporation: The changing of a liquid into vapours from the surface of the liquid without heating it.

F

Field force: The gravitational pull of the Earth acting on the body whether the body is in contact with the Earth or not.

Force of gravitation: The force due to which everybody of the universe attracts every other body.

Force: The agent that changes or tends to change the state of a body.

Friction: The force of resistance against the relative motion between two surfaces.

Fulcrum: The point around which lever revolves.

G

Geophysics: The branch of Physics that deals with the study of the internal structure of the Earth and tectonic plate motions etc.

Gravitational acceleration: Acceleration due to gravity of the Earth

Gravitational field strength: The gravitational force per unit mass.

Gravitational field: The field in a region in space in which a particle would experience a gravitational force.

Gravitational force: Mutual force of attraction between the objects.

Gravitational potential energy: Energy of a body due to its position in the gravitational field.

H

Heat capacity: The quantity of thermal energy absorbed by a body for increase in its temperature.

Heat: The branch of Physics that deals with the nature of heat, modes of transfer of heat and effects of heat.

Heat: The form of energy, which is transferred from one place to another because of temperature difference.

Horizontal component: The component of a force which is along horizontal Or x-direction.

I

Inertia: The characteristic of a body due to which it resists against any change in its state of rest or motion.

Input: A work, which is done on the machine

Internal energy: The sum of K. E. and P. E. associated with the atoms, molecules and particles of a body.

Isolated system: A group of interacting bodies on which no force is acting.

J

Joule: The amount of work done when a force of one newton displaces a body through one metre in the direction of force.

K

Kilowatt-hour: Work done in one hour at a rate of one kilowatt.

Kinematics: Study of motion of bodies without taking into consideration the mass and forces.

Kinetic energy: Energy of a body due to its motion.

Kinetic friction: Friction during motion.

L

Latent heat of fusion: The quantity of heat required to change one kilogram of a solid substance to liquid state during which its temperature remains constant.

Latent heat of vapourization: The quantity of heat required to change the state of one kilogram of a liquid to vapour or gaseous state during which its temperature remains constant.

Lever: A strong bar revolving around some point.

Light year: The unit of distance for celestial bodies equal to 9.46×10^{15} m.

Light: The branch of Physics that deals with the physical aspects of light and its properties; working and uses of optical instruments.

Like parallel forces: Forces acting along parallel lines in the same direction.

Limiting friction: The maximum value of static friction.

Line of action of a force: The line along which a force acts.

Linear motion: The motion of a body along a straight line.

Load arm: The intermediate distance between fulcrum and load.

Load moment: Product of load and load arm.

Load: Resistance or lifted up weight.

M

Mass: The characteristic of a body, which determines the acceleration produced by the application of a force.

Mechanical advantage: Ratio of load and effort.

Mechanics: The branch of Physics that deals with the motion of objects, causes and effects of motion.

Moment arm: The perpendicular distance between the axis of rotation and the line of action of the force.

Momentum: The product of mass and velocity of a body.

Motion: If a body changes its position with respect to its surroundings.

N

Negative vector: A vector, which has the same magnitude but opposite direction of another vector.

Neutral equilibrium: The condition of a body, in which its centre of gravity neither rises nor becomes lower of its original position after being disturbed.

Nuclear physics: The branch of Physics that deals with the properties and behaviour of nuclei and the particles within the nuclei.

O

Orbital velocity: The critical velocity of a satellite in order to keep on moving around the Earth at a specific height.

Output: A work, which is done by the machine.

P

Parallel force: The forces which are parallel to each other.

Perpendicular components: The components of a force which are mutually perpendicular to each other.

Physical quantities: All measureable quantities.

Physics: The branch of Science, which explains the properties of matter and energy.

Plasma physics: The branch of Physics that deals with the study of production, properties of the ionic state of matter - the fourth state of matter.

Position: Location of a place or a point with respect to some reference point.

Potential energy: The energy possessed by a body due to its position.

Power: Rate of doing work.

Prefixes: The words or letters added before a unit and stand for the multiples or submultiples of that unit.

Pressure: The force acting normally per unit area.

R

Radiation: Transfer of heat by infra red radiations requiring no medium for their transmission.

Random motion: Motion without any consideration of time and direction.

Rate of flow of heat: The amount of heat that flows in unit time.

Resolution of a force: Splitting up of a force into its components.

Rest: If a body does not change its position with respect to its surroundings.

Resultant force: Such a force, which shows the combined effect of two or more forces.

Retardation: Negative acceleration.

Rolling friction: The friction produced during the motion of one body over the other with the help of wheels.

Rotatory motion: The motion in which a body moves around an axis passing through it.

S

Scalar: A Physical quantity which is completely described by its magnitude only.

Scientific method: Logical applications of arguments that explain a certain phenomenon.

Scientific notation: The numbers written as power or prefix of ten in which there is only one non-zero number before the decimal

Significant figures: In a measurement, the correctly known digits and the first doubtful digit

Simple machine: A thing, which helps in doing work more easily.

Sliding friction: The friction between two surfaces sliding against each other.

Sound: The branch of Physics that deals with the physical aspects of sound waves their production, properties and applications.

Specific heat capacity: The quantity of heat, which changes the temperature of one kilogramme mass by 1 K.

Speed: Distance covered by a body in unit time.

Stability: The property of a body which does not undergo any change without the application of an external agency.

Stable equilibrium: The condition of a body in which it comes to its original position after being disturbed.

Static friction: The force of friction arising due to an applied external force before motion.

Strain: The change in the shape of an object under the action of an external force.

Stress: Force acting on unit area of an object.

Surface tension: The force acting along the surface of a liquid.

T

Temperature: The degree of hotness or coldness of a body.

Tensile strain: Change in length per unit original length.

Tension: The force acting along a string.

Thermal conductivity: The rate of flow of heat across the opposite faces of a metre cube maintained at a temperature difference of 1 K.

Thermal equilibrium: The property of a system when all parts of the system have the same temperature alongwith its surrounding.

Thermometer: A device used to measure temperature.

Thermometry: Art of measurement of temperature.

Torque: The capacity of a force to rotate a body.

Translatory motion: The motion of a body when it moves along a line without rotation.

Trigonometric ratios: The ratios of the sides of a right-angled triangle.

U

Uniform acceleration: Equal changes in velocity in equal intervals of time.

Uniform speed: Equal distances covered by a body in equal intervals of time.

Uniform velocity: Equal changes in displacement in equal intervals of time.

Unlike parallel forces: Forces that are parallel but have direction opposite to each other.

Unstable equilibrium: The condition of a body in which it does not come to its original position after being disturbed.

V

Vector: A physical quantity which is described completely by magnitude and direction.

Velocity: Rate of change of displacement.

Vibratory motion: Zig-zag motion of the molecules of gases and liquids.

W

Watt: The power of a body if it does work at the rate of one joule per second.

Weight: Force of gravitation acting on a body.

Work: The product of force and displacement.

Y

Young's modulus: The ratio of stress to tensile strain.

CHEMICAL EQUILIBRIUM IMPORTANT POINTS

* Reversible reactions are those in which products recombine to form reactants. These reactions never complete. They proceed in both ways; i. e. , forward and reverse.
* Dynamic equilibrium state is one at which forward and reverse reactions proceed at equal rate but in opposite directions so that overall reaction does not stop.
* Equilibrium constant K_c is a ratio of the product of concentration of products raised to the power of coefficients to the product of concentration of reactants raised to the power of coefficients as expressed in the balanced chemical equation.
* Equilibrium constant has no units when number of moles of reactants and products are same.
* By knowing the value of equilibrium constants, the extent of a reaction can be predicted.
* Reactions having large K_c value, proceed almost to completion.
* Reactions having small magnitude of K_c indicates that equilibrium state has established consuming small amount of reactants. Therefore, they never go to completion.
* Reactions having moderate magnitude have comparable amounts of reactants and products at equilibrium state.

MCQs

1. The characteristics of reversible reactions are the following except:

(a) products never recombine to form reactants*

(b) they never complete

(c) they proceed in both ways

(d) they have a double arrow between reactants and products

2. In the lime kiln, the reaction $CaCO_{3(s)} \longrightarrow CaO_{(s)} + CO_{2(g)}$ goes to completion because

(a) salt and water★
(b) salt and gas
(c) salt and an acid
(d) salt and a base

50. The conjugate acid of HPO_4^{2-} is:
(a) PO_4^{3-} (b) $H_2PO_4^{2-}$
(c) $H_2PO_4^-$★ (d) H_3PO_4

51 What is the pOH of 0.02M $Ca(OH)_2$?
(a) 1.698 (b) 1.397★
(c) 12.31 (d) 12.61

52. Which one of the following species is not amphoteric?
(a) H_2O (b) NH_3
(c) HCO_3 (d) SO_4^{2-}★

53. The product of Lewis acid-base reaction is called adduct. The bond between the adduct specie is:
(a) ionic
(b) covalent
(c) metallic
(d) coordinate covalent★

54. The water of crystallization is responsible for the
(a) melting points of crystals
(b) boiling points of crystals
(c) shapes of crystals★
(d) transition point of crystals

55. You want to dry a gas. Which one of the following salt you will use?
(a) $CaCl_2$★ (b) NaCl
(c) CaO (d) Na_2SiO_3

56. Ferric hydroxide ($Fe(OH)_3$) is precipitated out of solution when aqueous sodium hydroxide solution is added to ferric chloride ($FeCl_3$).
$FeCl_{3(aq)}$ + $3NaOH_{(aq)}$ ⟶ $Fe(OH)_{3(s)}$ + $3NaCl_{(aq)}$
Colour of the precipitate is:
(a) white (b) blue
(c) dirty green (d) brown★

57. Which ion is the conjugate base of sulphuric acid?
(a) SO_3^{2-} (b) S^{2-}
(c) HSO_3^- (d) HSO_4^-★

58. Which one of the following is a Lewis base?
(a) NH_3★ (b) BF_3
(c) H^+ (d) $AlCl_3$

59. According to the Lewis concept, acid is a substance which can
(a) donate a proton
(b) donate a pair of electron
(c) accept a proton
(d) accept a pair of electron★

60. Given K_w = $[H^+]$ $[OH^-]$ = 1.0×10^{-14} at 25 °C
What is the concentration of H^+ in pure water at 25°C?
(a) 1×10^{-7} mol dm^{-3}★
(b) 1×10^{7} mol dm^{-3}
(c) 1×10^{-14} mol dm^{-3}
(d) 1×10^{14} mol dm^{-3}

ORGANIC CHEMISTRY
IMPORTANT POINTS

★ Strong acids or bases ionize completely in water while weak acids and bases ionize partially.

★ According to Arrhenius concept, acids produce H^+ ions in aqueous solution while bases produce OH^- ions in aqueous solution.

★ According to Bronsted-Lowry concept, acid are proton donor and bases are proton acceptor, so this concept is applicable to non-aqueous solutions.

★ A substance that can behave as an acid as well as base depending upon the nature of other substances is called amphoteric.

★ According to Lewis concept; acids are electron pair acceptors and bases are electron pair donors.

★ The product of any Lewis acid base reaction is a single specie called adduct.

★ "p" scale is the conversion of very small figures into positive figures by taking the common logarithm of the small figure and multiplying it with-1.

★ pH scale is the negative logarithm of concentration of hydrogen ions.

★ A substance having pH less than 7 is acidic while a substance having pH

more than 7 is basic. A substance of pH 7 is called neutral.

- Salts are ionic compounds made up of metallic cation and non-metallic anion.
- Different methods for the preparation of soluble and insoluble salts have been discussed.
- Normal salts are made up of cations of strong bases and anions of strong acids.
- Acidic salts are made up of cations of weak bases and anions of strong acids.

MCQs

1. **The ability of carbon atoms to form chains is called**
   (a) isomerism
   (b) catenation★
   (c) resonance
   (d) condensation

2. **Coal having 90% carbon contents is called:**
   (a) peat
   (b) lignite
   (c) anthracite★
   (d) bituminous

3. **Main component of natural gas is:**
   (a) methane★ (b) propane
   (c) butane (d) propene

4. **The strong heating of coal in retorts in the absence of air is called**
   (a) fractional distillation
   (b) sublimation
   (c) roasting
   (d) destructive distillation★

5. **Pitch is black residue of:**
   (a) coke (b) coal tar★
   (c) coal (d) coal gas

6. **Natural gas is 85% methane. It is used to make the:**
   (a) carbon black★ (b) coke
   (c) coal tar (d) coal gas

7. **Which one of the following does not contain starch:**
   (a) sugar cane★ (b) maize
   (c) barley (d) potatoes

8. **Petroleum is refined by:**
   (a) destructive distillation
   (b) fractional distillation★
   (c) simple distillation
   (d) dry distillation

9. **In laboratory urea was prepared by:**
   (a) Wholer★
   (b) Rutherford
   (c) Berzelius
   (d) Dalton

10. **General formula of alkyl radical is:**
    (a) C_nH_{2n+2} (b) C_nH_{2n-2}
    (c) C_nH_{2n+1}★ (d) C_nH_{2n}

11. **Identify which one of the following compounds is a ketone.**
    (a) $(CH_3)_2CHOH$
    (b) $(CH_3)_2CO$★
    (c) $(CH_3)_2NH$
    (d) $(CH_3)_2CHCl$

12. **The functional group -COOH is found in:**
    (a) carboxylic acid★
    (b) aldehydes
    (c) alcohols
    (d) esters

13. **Which one of the following statements is not true about fossil fuels?**
    (a) they all contain carbon
    (b) they are renewable★
    (c) they produce pollutants when burnt
    (d) they cause acid rain

14. **Which one of the following is the hardest coal?**
    (a) peat
    (b) lignite
    (c) bituminous
    (d) anthracite★

15. **In which of the following groups, oxygen is attached on both sides with carbon atoms?**
    (a) ketone (b) ether★
    (c) aldehyde (d) ester

16. **Carbonization process is the conversion of:**

44. **Alkynes are also called as:**
(a) Paraffins (b) Olefins
(c) Acetylenes★ (d) Alcohols

45. **Acetylene reacts with bromine water to give:**
(a) Tetrabromoethane★
(b) Carbon Tetrachloride
(c) Carbon tetra bromide
(d) Hydrogen bromide

46. **HO — C(=O) — C(=O) — OH is the formula of**
(a) Acetic acid (b) Oxalic acid ★
(c) Ketones (d) Acetaldehyde

47. **Which hydrocarbons are connected by single covalent bond?**
(a) Alkenes (b) Alkynes
(c) Alkanes★ (d) Esters

48. **Which gas is used as domestic fuel?**
(a) Ethane (b) Ethene
(c) Ethyne (d) Methane★

49. **Benzene is a _______ hydrocarbon.**
(a) Aliphatic (b) Acyclic
(c) Cyclic★ (d) Heterocyclic

50. **$H_3C = CH_3$ is an:**
(a) Alkane (b) Alkene
(c) Alkyne★ (d) Ketone

51. **The main sources of alkanes are:**
(a) Petroleum (b) Natural fats
(c) Coal gas (d) Both a & b★

52. **When alcohols are dehydrated in the presence of a catalyst, they form:**
(a) Alkanes (b) Alkenes★
(c) Alkynes (d) Ketones

53. **When unsaturated compounds are oxidized with $KMnO_4$ solution:**
(a) Discharges★ (b) Reduces
(c) Darkness (d) Changes

54. **The functional group of glycol is:**
(a) Ester linkge
(b) Hydroxyl group★
(c) Alkyl halide
(d) Aldehyde

55. **H — C(=O) — C(=O) — H is the structural formula of**
(a) Glycol (b) Oxalic acid
(c) Glyoxal★ (d) Glycerine

56. **Methane is also called as:**
(a) Marsh gas★ (b) Fuel gas
(c) Coal gas (d) All of these

57. **Propane and butane are sold as:**
(a) Liquid petroleum gas★
(b) Compressed Natural gas
(c) Environment support gas
(d) Natural fuel gas

58. **Ethene is slightly:**
(a) Lighter than air
(b) Denser than air★
(c) Soluble in water
(d) Reactive

59. **When tetrachloroethane is heated with zinc powder, _______ is formed.**
(a) Ethane
(b) Formoldehyde
(c) Acetylene★
(d) Carbon Tetrachloride

60. **Which is the simplest hydrocarbon?**
(a) Butane (b) Propane
(c) Ethane (d) Methane★

BIOCHEMISTRY

★ Hydrocarbons are organic compounds of carbon and hydrogen elements. They are alkanes, alkenes and alkynes.

★ Open chain hydrocarbons are classified as saturated and unsaturated.

★ Saturated hydrocarbons consist of each carbon atom having its tetravalency fully satisfied by single bonds. They are called alkanes and have general formula

★ Unsaturated hydrocarbons consist of double and triple bonds. Compounds consisting of double bonds are called alkenes. They have general formula

(b) Water
(c) Carbon dioxide
(d) Oxygen★

45. Ozone hole is a place where ozone layer is:
(a) Depleted★ (b) Produced
(c) Thinned (d) Reduced

46. Ozone protects us from:
(a) Infrared radiations
(b) Ultraviolet radiations★
(c) Bluetooth radiations
(d) Greenhouse radiations

47. The percentage of Oxygen in atmosphere by volume is:
(a) 18.94% (b) 17.67%
(c) 20.94%★ (d) 16.67%

48. Ozone is represented by:
(a) O_2 (b) O
(c) CO (d) O_3★

49. Mixture of NO and NO_2 are represented by:
(a) NO_x★ (b) N_xO
(c) N_xO_x (d) NO_x

50. Ozone layer is found in:
(a) Troposphere
(b) Stratosphere★
(c) Mesosphere
(d) Lithosphere

51. The separation of insoluble solid particles from a liquid is called:
(a) Distillation
(b) Crystallization
(c) Filtration★
(d) Evaporation

52. The harmful substances present in the air are called:
(a) Contaminants
(b) Land pollutants
(c) CFCs
(d) Air pollutants★

53. Identify the secondary pollutant.
(a) H_2SO_4★ (b) SO_2
(c) NH_3 (d) SO_3

54. Acid rain damages:
(a) Leaves of trees (b) a, c & d★
(c) Crops (d) Buildings

55. Rain water is acidic because of:
(a) SO_3gas (b) CO_2 gas★
(c) NO_2gas (d) SO_2 gas

56. PAN is the abbreviation of:
(a) Poly aniline nitrate
(b) Peroxy acetyl nitrate★
(c) Poly acetyl nitrate
(d) Proxy acetyl nitrite

57. After mesosphere, the layer of atmosphere is:
(a) Thermosphere★
(b) Lithosphere
(c) Stratosphere
(d) Biosphere

58. Naturally, sulphur compounds are emitted in:
(a) Bacterial decay★
(b) Gas exhausts
(c) Industries
(d) Tanning leather

59. Decreased ozone layer will increase infectious diseases like:
(a) Malaria★ (b) Typhoid
(c) Pneumonia (d) None

60. Due to increase in earth temperature due to green house effect, this phenomenon is called:
(a) Global warming★
(b) Global crisis
(c) World war
(d) Rotational debt

WATER

IMPORTANT POINTS

★ Atmosphere is the envelope of different gases around the Earth.

★ Atmosphere is divided into four regions; troposphere, stratosphere, mesosphere and thermosphere.

★ Troposphere is just above Earth's surface and extends upto 12 kilometre.

★ Stratosphere is next to troposphere and extends upto 50 km. In this region, temperature rises upwards because of presence of ozone layer.

★ Mesosphere is next to stratosphere and extends up to 85 km.

(b) Long chain sulphonic acid esters
(c) Polymeric hydrocarbons
(d) Polymeric aldehydes

353. In fireworks, the green flame is produced because of:
(a) Mercury (b) Sodium
(c) Potassium (d) Barium★

354. Firdous Al Hikmat Fe Ilmul Kemia was written by
(a) Alberuni
(b) Jabir bin Haiyan
(c) Khalid bin Yazeed★
(d) Buali Sina

355. Ammonia was obtained from urine by
(a) Aljahiz (b) Wohler★
(c) Jabir bin Haiyan (d) Al-Beruni

356. Madam Curie is famous for his work in the field of
(a) Biochemistry
(b) Nuclear chemistry★
(c) Analytical chemistry
(d) Organic chemistry

357. Which form of phosphorus is used in safety matches?
(a) White phosphorus
(b) Yellow phosphorus
(c) Red phosphorus★
(d) Black phosphorus

358. Dalton's atomic theory gave the concept of
(a) Valency★ (b) Electrons
(c) Radioactivity (d) Ionization

359. When radioactive rays are passed through air or any gas, they cause it to
(a) Ionize★ (b) Evaporate
(c) Freeze (d) Boil

360. The elements in the first period of the periodic table are
(a) Hydrogen and helium★
(b) Hydrogen, helium, nitrogen and oxygen
(c) Hydrogen, helium and carbon
(d) Hydrogen, nitrogen and oxygen

IMPORTANT TERMINOLOGY

A

Acid rain is formed by dissolving acidic air pollutants such as sulphur dioxide and nitrogen dioxide by rain water.

Acidic salts are formed by partial replacement of a replaceable H^+ ion of an acid by a positive metal ion.

Alkanes are the simplest hydrocarbons in which each carbon is attached through single bonds with other atoms. They have general formula C_nH_{2n+2}.

Alkenes are unsaturated hydrocarbons having double bonds. They have general formula C_nH_{2n}.

Alkyl radicals are derivatives of alkanes. They are formed by the removal of one hydrogen atom from molecule.

an alkane

Alkynes are unsaturated hydrocarbon having a triple bond in their molecules. They have general formula C_nH_{2n-2}

Amino acids are organic compounds consisting of both amino and carboxyl groups.

Ammonical Liquor is a solution of ammonia gas in water.

Amphoteric is a substance that can behave both as an acid and as a base.

Arrhenius acid is a substance that contains hydrogen and produces H^+ ions in aqueous solution.

Arrhenius base is a substance that contains the hydroxyl group and produces hydroxide OH^- ions in aqueous solution.

Atmosphere is the envelope of different gases around the Earth. It extends continuously from the Earth's surface outwards without any boundary.

B

Basic salts are formed by the incomplete neutralization of a polyhydroxy base by an acid.

Bronsted-Lowry base is a substance that can accept a proton from another substance.

about 85% is methane, other gases are ethane, propane and butane.

Normal salts are formed by the total replacement of ionizable H^+ ions of an acid by a positive metal ion or NH_4^+ ions.

O

Oligosaccharides give 2 to 9 units of monosaccharides on hydrolysis

Ore is a natural deposit containing mineral of an element to be extracted.

Organic compounds are compounds of carbon and hydrogen and their derivatives.

Ozone hole is the region in which ozone layer depletes in atmosphere.

Ozone is an allotrope of oxygen. Its maximum concentration called ozone layer lies in stratosphere region about 25 to 30 km away from Earth's surface.

P

Permanent hardness is because of presence of sulphates and chlorides salts of calcium and magnesium.

Pesticides are dangerous organic chemicals used to kill or control pests.

Petroleum is a dark brownish or greenish black coloured viscous liquid.

pH is the negative logarithm of molar concentration of the hydrogen ions.

Pollutants are waste materials that pollute air, water or soil.

Polysaccharides are the carbohydrates consisting of hundreds to thousands of monosaccharides.

Primary pollutants are the waste or exhaust products drivenout because of combustion of fossil fuels and organic matter.

Proteins are highly complicated nitrogenous compounds made up of amino acids.

R

Reduction means addition of nascent hydrogen.

Refining process is the separation of crude oil mixture into various useful products (fractions). It is carried out by a process called fractional distillation.

Reversible reactions are those in which products can recombine to form reactants.

Roasting is heating of concentrated ore in a furnace in the presence of air.

S

Salt is defined as an ionic compound composed of a metallic cation and non metallic anion

Saturated hydrocarbon is compound in which all the four valencies of carbon atoms are fully satisfied (saturated) by single bonds with other carbon atoms and hydrogen atoms.

Secondary pollutants are produced by the various reactions of primary pollutants with water.

Smelting is the further heating of the roasted ore, flux of sand and coke in a blast furnace in the presence of excess of air.

Soft Water is that produces good lather with soap

Stratosphere region covers the atmosphere from 12 to about 50 kilometres.

Strong acids and bases are those that can ionize completely.

Substitution reaction in which one or more hydrogen atoms of a saturated compound are replaced with some other atoms (like halogen).

T

Temporary hardness is because of presence of bicarbonates of calcium and magnesium.

Thermosphere lies beyond mesosphere. In this region temperature rises gradually.

Troposphere is just above the Earth's surface and extends upto 12 kilometres.

U

Unsaturated hydrocarbon are compounds in which the two carbon atoms are linked by a double or a triple bond.

W

Water borne diseases are caused by drinking polluted water or eating food prepared with polluted water.

Water softening is removal of hard water ions (Mg^{2+}, Ca^{2+}).

Weak acids and bases are those which ionize partially in water.